**Traffic Signs Recognition**

**1.INTRODUCTION**

**AIM**

**MOTIVATION**

**SCOPE**

**OBJECTIVES**

**2.RELATED WORK**

**BENEFITS OF TRAFFIC SIGNS**

**APPLICATIONS**

**FLOW CHART**

**Aim:- Traffic signs recognition python project.**

**Motivation:-**

Classification of traffic signs with partial occlusions is important for traffic sign maintenance and inventory systems. It is also important to help drivers identify possible traffic signs in time. Motivated by human cognitive processes in identifying an occluded sign, a novel structure is designed to explicitly handle occluded samples in this paper. Occlusion maps are analyzed for possible occluded signs, and a new occlusion descriptor is proposed to distinguish occluded signs from negative samples. A series of tests shows that the developed method could effectively handle samples with partial occlusions and thus reduce the missed detections caused by occlusions. The developed method could also be easily used for any other object detection.

**Scope:-**

Traffic sign classification is the process of automatically recognizing traffic signs along the road, including speed limit signs, yield signs, merge signs, etc. Being able to automatically recognize traffic signs enables us to build “smarter cars”.

Self-driving cars need traffic sign recognition in order to properly parse and understand the roadway. Similarly, “driver alert” systems inside cars need to understand the roadway around them to help aid and protect drivers.

Traffic sign recognition is just one of the problems that computer vision and deep learning can solve.

The dataset we’ll be using to train our own custom traffic sign classifier is the German Traffic Sign Recognition Benchmark **(GTSRB).**

The GTSRB dataset consists of 43 traffic sign classes and nearly 50000 images.

In the real-world, traffic sign recognition is a two-stage process:

1. **Localization:** Detect and localize where in an input image/frame a traffic sign is.
2. **Recognition:** Take the localized Region of Interest**(ROI)** and actually recognize and classify the traffic sign.

Object detection enables you to not only recognize the traffic sign but also localize where in the input frame the traffic sign is.

**Objectives:-**

The process of object detection is not as simple and straightforward as image classification. It is actually far, far more complicate the details and intricacies are outside the scope of blog post.

To building this traffic sign classification model :

Explore the dataset

* Build a CNN model
* Train and validate the model
* Test the model with test dataset.

**--> Explore the dataset**

Our ‘train’ folder contains 43 folders each representing a different class. The range of the folder is from 0 to 42. With the help of the OS module, we iterate over all the classes and append images and their respective labels in the data and labels list.

**--> Build a CNN model**

To classify the images into their respective categories, we will build a CNN modelConvolutional Neutral Network ( CNN ) is best for image classification purposes .We compile the model with Adam optimizer which performs well and loss is “ categorical crossentropy” because we have multiple classes to categorize.

**--> Train and validate the model**

After building the model architecture, we then train the model using model fit. I tried with batch size 32 and 64. Our model performed better with 64 batch size. And after 15 epochs the accuracy was stable.

**--> Test our model with test dataset**

Our dataset contains a test folder and in a test.csv file, we have the details related to the image path and their respective class labels. We extract the image path and labels using pandas.

Some of the Traffic signal installation technical specifications

are :

System master – Include both field-located arterial master and central computer .

Power connection – Method for furnishing power to control and specifications for power line.

Sealing – Requirements for sealing conduit to provide continuously sealed electrical circuit. .

Signal cable – Include insulation , physical properties ,electrical

properties, color coding and filters.

**Software Requirements**

* Traffic system control algorithm requirements.
* Graphics features for area wide map, subsystem and intersections.
* Real-time functions.
* Integration functions with CCTV , CMS , HAR.
* Backup capabilities.
* Operating systems.
* Field equipment diagnostic functions.

**Benefits of Traffic Signs :**

* Increasing the traffic handling capacity of roads
* Reducing collisions and waiting time for both vehicles and pedestrians.
* Encouraging travel within the speed limit to meet green lights
* Reducing unnecessary stopping and starting of traffic - this in turn reduces fuel consumption, air and noise pollution.
* Reducing travel time.

**Applications:**

Traffic control signals provide for an orderly movement of traffic.

They help in reducing the frequency of an accident of some special nature of right accidents

They direct traffic on different routes without excessive congestion.

**For example :**

In Mumbai vehicular population on the rise, the Mumbai Police’s ambitious Intelligent Traffic Management System (ITMS), which proposes to use artificial intelligence to decongest before two years. The Mumbai government implement the Traffic signals using artificial intelligence .

Another benefit of the ITMS is that it will centralise the monitoring of traffic violations. Having already developed an integrated e-challan system for fines, sources said that the ITMS will augment this further, making it more difficult for violators to evade penalties. Traffic and monitor violations.

**Flowchart**

